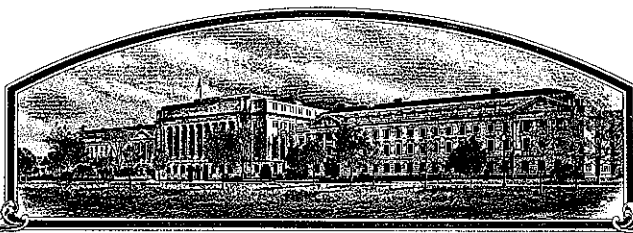


No.

9100060



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Goertzen Seed Research

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS OF THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Haven'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 30th day of November in the year of our Lord one thousand nine hundred and ninety-three.

Attest:

Kenneth D. Hears

Commissioner

Plant Variety Protection Office
Agricultural Marketing Service

Mike Esny
Secretary of Agriculture



amended form for Haven 3/3/1992 9100060

Public reporting burden for this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Office, OIRM, Room 404-W, Washington, D.C. 20250; and to the Office of Management and Budget, Paperwork Reduction Project (OMB #0581-0055), Washington, 20250.

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) GOERTZEN SEED RESEARCH		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO. G1857	3. VARIETY NAME Haven AAA 8 mar 1995
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) 6 Stadium Dr. Haven, Kansas, 67543		5. PHONE (include area code) 316-465-7744	FOR OFFICIAL USE ONLY PVPO NUMBER 9100060 Filing and Examination Fee: \$2150.- Date Jan. 3, 1991 Certificate Fee: \$250.00 Date Nov. 16, 1993
6. GENUS AND SPECIES NAME Triticum aestivum	7. FAMILY NAME (Botanical) Gramineae		
8. CROP KIND NAME (Common Name) Wheat, common	9. DATE OF DETERMINATION July, 1988		
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) unincorporated business			
11. IF INCORPORATED, GIVE STATE OF INCORPORATION		12. DATE OF INCORPORATION	
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Kenneth & Betty Goertzen, wheat breeders Goertzen Seed Research 6 Stadium Dr. Haven, Kansas, 67543			

PHONE (include area code): **316-465-7744**

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

- a. ☒ Exhibit A, Origin and Breeding History of the Variety.
- b. ☒ Exhibit B, Novelty Statement.
- c. ☒ Exhibit C, Objective Description of Variety.
- d. ☒ Exhibit D, Additional Description of Variety.
- e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.
- f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office **12/29/1990**
- g. ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)
☒ YES (If "YES," answer items 16 and 17 below) ☐ NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☒ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ FOUNDATION ☒ REGISTERED ☒ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____)
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☒ NO **not at time of original application 12-29-1990**

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT (Owner(s)) <i>Kenneth L Goertzen</i>	CAPACITY OR TITLE <i>Wheat Breeder</i>	DATE <i>12/29/1990</i>
SIGNATURE OF APPLICANT (Owner(s)) <i>Betty Lanning Goertzen</i>	CAPACITY OR TITLE <i>wheat breeder</i>	DATE <i>12/29/1990</i>

EXHIBIT A ORIGIN AND BREEDING HISTORY OF HAVEN (G1857)

A Sturdy offtype brown chaff selection was crossed with Plainsman V. This cross was then crossed with Bejostaja I X Plainsman V sib (G58). Progeny from this cross that had brown chaff, same semi-dwarf height, bearded, good tillering, and free of head, leaf, & stem diseases were bulked in the F4 generation. Seed increase from this bulk has been maintained for uniformity of agronomic characteristics.

Breeders seed has been maintained by isolation, selection, and roguing. This line has appeared stable and uniform during three years of testing and seed increase. White glumed offtypes appear approximately 1:5000. Breeders seed will be maintained by Goertzen Seed Research.

This variety will be grown only under contract to produce added value grain in an identity preserved production program.

EXHIBIT B Novelty of HAVEN (G1857)

The most similar variety to Haven is the Plainsman V parent. They differ in the following characteristics:

HAVEN

Mixing time is shorter
for Haven than Plainsman V

Gluten strength is less
strong for Haven than
Plainsman V from grain
evaluated from side by side
plantings (Haven - med-strong)

High Molecular weight
glutenin subunits as
reported by Dr. Lookhart
at U.S.D.A. Grain Mktg.
Research Center
1,5,7,8,10

Leaf below flag leaf
is longer and narrower
than Plainsman V when grown
side by side.
length - 27-29 cm
width -10mm

PLAINSMAN V

Mixing time is longer for
Plainsman V than Haven

Plainsman V super strong

High molecular weight glutenin
subunits as reported by Dr.
Lookhart at USDA Grain Mktg
Research Center
1,2*,5,7,8,10

leaf below flag leaf
length 22-23 cm
width 11-13mm

The Haven variety is to be used only for contract production of added value grain. For this reason quality characteristics were emphasized in its selection .

A number of GSR wheats were evaluated for Gluten strength in a commercial laboratory in 1992. These were grown under the same conditions in an observation plot at Haven, Kansas.

Haven
9100060

weak=20, mellow=40, medium=60, strong=80, super strong=100

Variety	Gluten strength
Plainsman V	100
Karl	100
Discovery	100
GI990	100
Snow White	100
G2542	80
G2500	80
GI056	80
Haven	60

In 1991 a number of GSR wheats grown side by side under the same treatment were also evaluated for gluten strength. These were grown at Haven, Kansas.

Variety	Gluten Strength
Plainsman V	100
Haven	80

Haven variety has a long mix time but not as long as Plainsman V. Data from a commercial laboratory indicates mixing time from an observation plot at Haven, Kansas where all the varieties were given the same treatment.

YEAR	VARIETY	MINUTES MIX TIME
1992	Haven	11
	Plainsman V	13
1991	Haven	10
	Plainsman V	20
1990	Haven	9
	Plainsman V	24

9100060

Exhibit C Disease Resistance of Haven not fully documented at this time.

G1857 Haven

FORM APPROVED: OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
~~INVESTMENT AND CREDIT DIVISION~~
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (TRITICUM SPP.)

INSTRUCTIONS: See Reverse.

NAME OF APPLICANT(S)

GOERTZEN SEED RESEARCH

ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code)

Route 2, Box 43
Haven, Kansas, 67543

FOR OFFICIAL USE ONLY

PVPO NUMBER

9100060

VARIETY NAME OR TEMPORARY
DESIGNATION

HAVEN

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g., or) when number is either 99 or less or 9 or less.

1. KIND:

1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

1 = SPRING 2 = WINTER 3 = OTHER (Specify) 1 = SOFT 3 = OTHER (Specify)
2 = HARD

1 = WHITE 2 = RED 3 = OTHER (Specify)

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

FIRST FLOWERING LAST FLOWERING

4. MATURITY (50% Flowering):

NO. OF DAYS EARLIER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS

NO. OF DAYS LATER THAN 4 = LEMHI 5 = HUGAINE 6 = LEEDS 7 = *Plainsman*

5. PLANT HEIGHT (From soil level to top of head):

CM. HIGH

CM. TALLER THAN

CM. SHORTER THAN 1 = ARTHUR 2 = SCOUT 3 = CHRIS
4 = LEMHI 5 = HUGAINE 6 = LEEDS 7 = *Plainsman*

6. PLANT COLOR AT BOOTING (See reverse):

1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHUR COLOR:

1 = YELLOW 2 = PURPLE

8. STEM:

Anthocyanin: 1 = ABSENT 2 = PRESENT

Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

NO. OF NODES (Originating from node above ground)

Waxy bloom: 1 = ABSENT 2 = PRESENT

Internodes: 1 = HOLLOW 2 = SOLID

CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

Anthocyanin: 1 = ABSENT 2 = PRESENT

Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

Flag leaf at booting stage: 1 = ERECT 2 = RECURVED
3 = OTHER (Specify):

Flag leaf: 1 = NOT TWISTED 2 = TWISTED

Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

MM. LEAF WIDTH (First leaf below flag leaf)

CM. LEAF LENGTH (First leaf below flag leaf)

11. HEAD:

- ☒ 2 Density: 1 = LAX 2 = *Mid* DENSE ☒ 1 Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____
- ☒ 4 Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED
- ☒ 5 Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify) _____
- ☒ 08 CM. LENGTH ☒ 09 MM. WIDTH

12. GLUMES AT MATURITY:

- ☒ 2 Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.) ☒ 3 Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

- 3, ☒ 5 Shoulder: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED shape: 4 = SQUARE 5 = ELEVATED 6 = APICULATE

- ☒ 1 Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

- ☒ 1 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

- ☒ 1 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

- ☒ 1 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

- ☒ 1 Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL ☒ 1 Check: 1 = ROUNDED 2 = ANGULAR
- ☒ 1 Brush: 1 = SHORT 2 = MEDIUM 3 = LONG ☒ 1 Brush: 1 = NOT COLLARED 2 = COLLARED
- ☒ 5 Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK
- ☒ 3 Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____
- ☒ 07 MM. LENGTH ☒ 03 MM. WIDTH ☒ 28 GM. PER 1000 SEEDS

17. SEED CREASE:

- ☒ 1 Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' *narrow* 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'
- ☒ 1 Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' *shallow* 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- ☒ 0 STEM RUST (Race) ☒ 0 LEAF RUST (Race) ☒ 0 STRIPE RUST (Race) ☒ 0 LOOSE SMUT
- ☒ 0 POWDERY MILDEW ☒ 0 BUNT ☒ 0 OTHER (Specify) _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- ☒ 0 SAWFLY ☒ 0 APHID (Bydv.) ☒ 0 GREEN BUG ☒ 0 CEREAL LEAF BEETLE
- ☒ 0 OTHER (Specify) _____ HESSIAN FLY RACES: ☒ GP ☒ A ☒ B ☒ C ☒ D ☒ E ☒ F ☒ G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	<i>Plainsman V</i>	Seed size	G53 Advantage
Leaf size	G53	Seed shape	G53 "
Leaf color	G53	Coleoptile elongation	G53 "
Leaf carriage	<i>Plainsman V</i>	Seedling pigmentation	G53 "

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

- (a) L.W. Briggie and L. P. Reitz, 1963, *Classification of Triticum Species and Wheat Varieties Grown in the United States*, Technical Bulletin 1278, United States Department of Agriculture.
- (b) W.E. Walls, 1965, *A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity*, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

EXHIBIT D Description of HAVEN

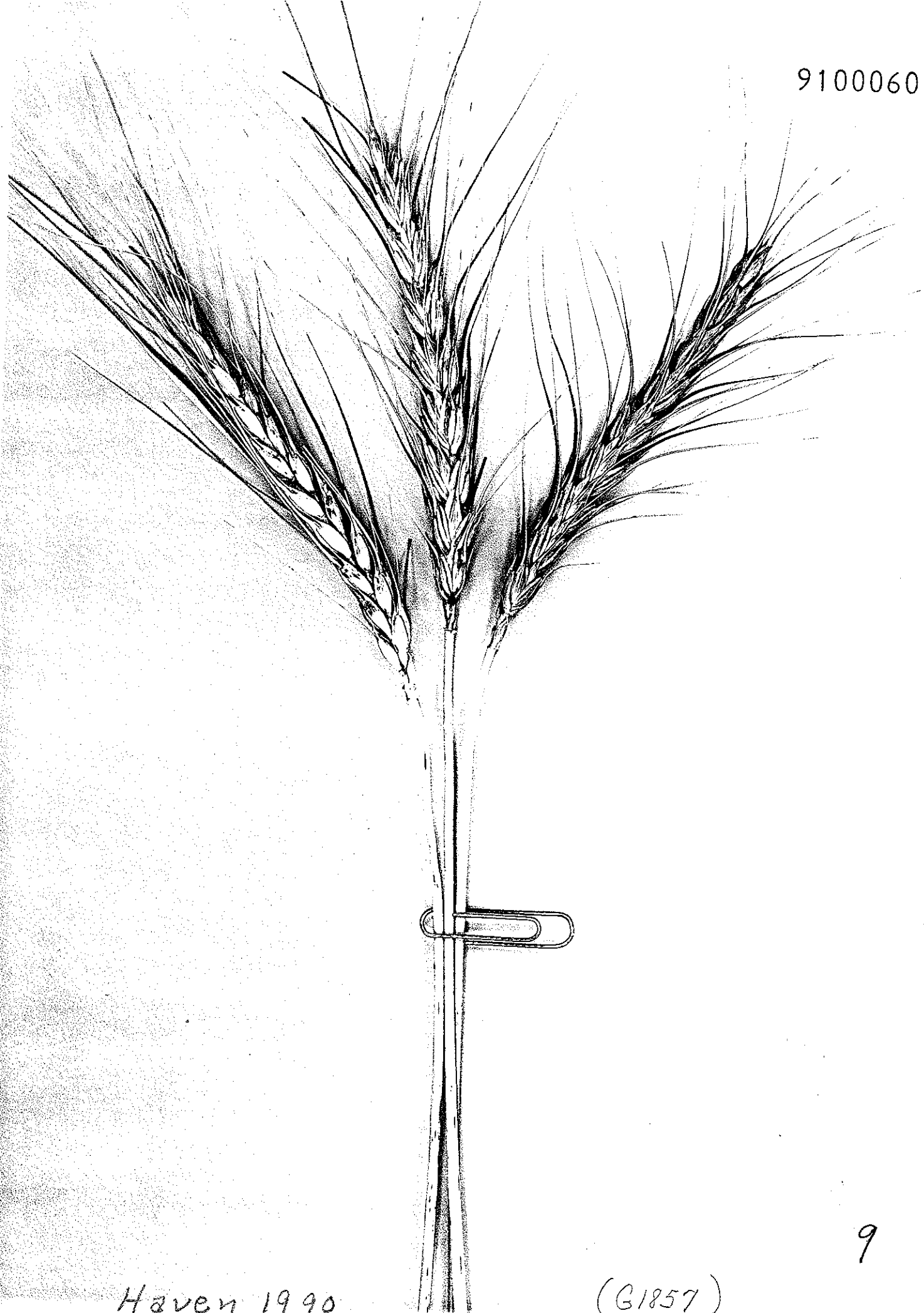
Haven is a semi dwarf hard red winter wheat. Flag leaf is held erect at booting stage. The spike is awned, tapering, medium dense with brown chaff color and inclined to nodding heads. 1-3 sterile florets are at the base of the head.

The glume is medium length and wide. The shoulder is rounded or elevated with obtuse beak.

The seed shape is ovate with short brush and rounded check. Phenol reaction is black. Seed crease is narrow and shallow.

Haven was grown in test plots in both England and Southern France as well as Haven, Kansas in 1989-1990. The grain from these tests were evaluated and the quality remained very good at all three locations.

9100060



Haven 1990

(G1857)

9

1988 Crop - Lines grown at Goertzen Seed Research Haven, KS.

9100060

1988 Lab #	WHEAT	wt/bu lbs.	ash %	Protein %	Flour yield %	FLOUR		Absorp. Tion	Dough Mix		Bread		Loaf Volume 100 g flour as rec'd cc.
						Ash %	Protein %		Date min.	Time min.	Grain	Crumb Color	
Check Newton	10-172	62°	1.59	10.7	71.5	.40	9.9	57.7	3 5/8	3 1/2	S	S	86.5
G-1760	-73	59°	1.75	15.7	76.1	.46	15.4	65.6	5 3/4	3 1/4	S	S	1138
G-542	-76	58°	1.73	15.3	74.4	.49	14.8	65.8	7 7/8	3 3/4	S	S	112.5
G-1600	-79	58°	1.66	15.3	73.7	.44	14.8	64.8	7	3 5/8	S	S	114.5
G-1598	-80	58°	1.67	15.3	72.3	.42	14.6	61.9	5	3 1/4	S	S	113.7
G-1857	-82	58°	1.68	14.9	74.2	.46	14.2	60.7	4 3/8	3	S	S	110.0
G-1859	-84	58°	1.61	16.3	72.6	.39	15.6	62.9	5 3/4	3 1/4	S	S	120.5
G-1093	-85	58°	1.62	15.8	75.5	.46	15.3	63.6	6 3/4	4 1/8	S	S	114.7
G-1754	-86	56°	1.68	16.0	71.3	.45	15.3	62.3	4 5/8	3 1/4	S	S	111.6
G-1753	-87	58°	1.63	17.1	73.7	.39	16.6	64.6	7 7/8	4 1/4	S	S	130.8
G-1759	-88	57°	1.70	17.6	73.7	.40	17.2	65.1	4 3/4	2 3/4	S	S	134.1
G-1250	-90	59°	1.47	15.1	74.5	.44	14.7	61.8	6	3 3/4	S	S	103.5
G-1113	-148	59°	1.76	15.4	70.8	.44	14.4	62.4	4 1/2	2 7/8	S	S	110.5
G-53	-162	59°	1.78	15.4	75.5	.49	15.0	62.8	5	3 1/4	S	S	108.8
G-1056	-170	58°	1.65	16.4	70.6 ^{soft}	.40	15.5	61.7	4 7/8	3	S	S	125.8
Phonomena V	11-(13-21)	59°	1.60	16.3	72.8	.45	15.6	62.7	6 1/8	4 1/8	S	S	121.2

Evaluations by USDA Grain Marketing Research Center

CHEMICAL, PHYSICAL, & BREAD MAKING DATA FOR WHEAT CULTIVARS HARVESTED
IN FRANCE ENGLAND AND AT HAVEN, KANSAS IN 1990

		BAKE MIXO-								
	WHEAT	WHERE GROWN	FLOUR ASH %	FLOUR PROTEIN	BAKE ABS.	DOUGH MIX TIME	GRAM MIX TIME	LOAF VOL. C.C.		
<i>KS</i> check	Newton	Haven, Ks.	.469	11.6	60.8	3 1/8 min.	3 min.	1000		
	Advantage	" "	.490	13.9	65.8	5 1/4 "	4 "	1133		
	Haven	" "	.4	14.2	65.0	4 1/8 "	3 1/4 "	1068		
<i>Engl</i> check	Mercia	England	.474	10.8	61.5	3 1/4 "	2 1/4 "	805		
	Advantage	" "	.519	12.8	66.3	3 1/2 "	2 3/8 "	973		
	Haven	" "	.558	13.4	66.3	3 3/4 "	3 3/8 "	995		
<i>check</i>	Newton	France	.437	12.5	66.5	4 1/2 "	3 1/2 "	960		
	Advantage	" "	.418	12.7	66.5	4 1/8 "	3 3/8 "	956		
	Haven	" "	.47	12.8	67.0	3 1/8 "	3 "	976		
1988 DATA FROM CULTIVARS GROWN AT HAVEN, KANSAS										
									Flour Yield	
	Newton	Haven, Ks.	.4	9.9	57.7	3 5/8 min	3 1/2 min.	865	21.5	
	Plainsman I	" "	.45	15.6	62.7	6 1/2 "	4 1/8 "	1212	22.8	
	Advantage	" "	.46	15.4	65.6	5 3/4 "	3 1/4 "	1138	24.1	
	Haven	" "	.46	14.2	60.7	4 3/8 "	3 "	1100	24.2	
AGRONOMIC DATA FROM 1989/90 SEASON GROWN AT CAMBRIDGE, ENGLAND BY NATIONAL INSTITUTE OF AGRICULTURAL BOTANY										
The sowing date was October 10, 1989										
The soil type was sandy loam										
Three replications were planted										
The previous crop was field peas										
120 kg. N applied per hectare										
BREEDING NO. OR NAME			YIELD IN METRIC TON/H.		HEIGHT cm.	% LODGING	DAYS TO RIPENING			
Mercia			6.96		78.4	0	285.3			
G53 (Advantage)			4.82		76.5	0	279.0			
G1857 (Haven)			4.96		77.0	1.7	277.0			
			CV% 8.1							

Table II. (QUADRANT MILL)

9100060

Milling quality ranked according to extraction. All shrivelled grain was removed in order to show genetic potential for the various tests. LSD for flour extraction is .45%. Bread baking was performed on ~~the same~~ wheat where all shrivelled grain was not removed.

Lab no.	Cultivar	Test Weight	Ext. (%)	SE (%)	Milling Grade
STANDARD	ARKAN (LB90-5)		77.4	37.7	
90515	ADVANTAGE/LB90-18	61.3	79.5	35.0	
90521	ADVANTAGE (G53)	61.4	79.1	35.0	
90511	G1093	60.2	78.5	36.0	
90509	G790	59.2	78.3	42.0	
90501	G1760	61.0	78.2	33.1	
90516	G1759	59.4	78.1	37.9	
90520	HAVEN (G1857)	61.3	78.0	36.1	
90504	G62	59.9	77.7	39.6	
90507	G1753	60.3	77.7	38.2	
90517	G1859	60.2	77.6	38.6	
90518	G1598	60.3	77.4	42.1	
90502	ARKAN /LB90-5	60.0	77.4	37.7	
90503	NEWTON /LB90-6	60.0	76.9	40.7	
90510	G1113	60.0	76.9	41.3	
90513	G1323 (white)	61.5	76.4	38.0	
90512	G1313 (white)	62.2	76.0	31.0	
90508	G1754	59.0	75.6	41.5	
90506	G1858	61.2	74.4	38.5	
ENGLISH GROWN					
90524	ADVANTAGE	62.8	78.5	35.2	
90523	HAVEN	63.1	78.3	36.2	
90522	MERCIA	64.2	76.8	30.6	
SOFT RED WINTER					AWRC (%)
STANDARD	CALDWELL		73.4	64.8	
90514	CALDWELL	56.4	73.4	64.8	57.4
90519	G1056	61.0	72.1	48.1	56.5
90505	G1420	60.4	71.7	55.9	58.6

SE = "Softness Equivalence"

QUADRANT MILL (wheat grown in France)

Table III.

Milling quality ranked according to extraction. All shrivelled grain was removed in order to show genetic potential for the various tests. LSD for flour extraction is .45%. Bread baking was performed on ~~the same~~ wheat where all shrivelled grain was not removed.

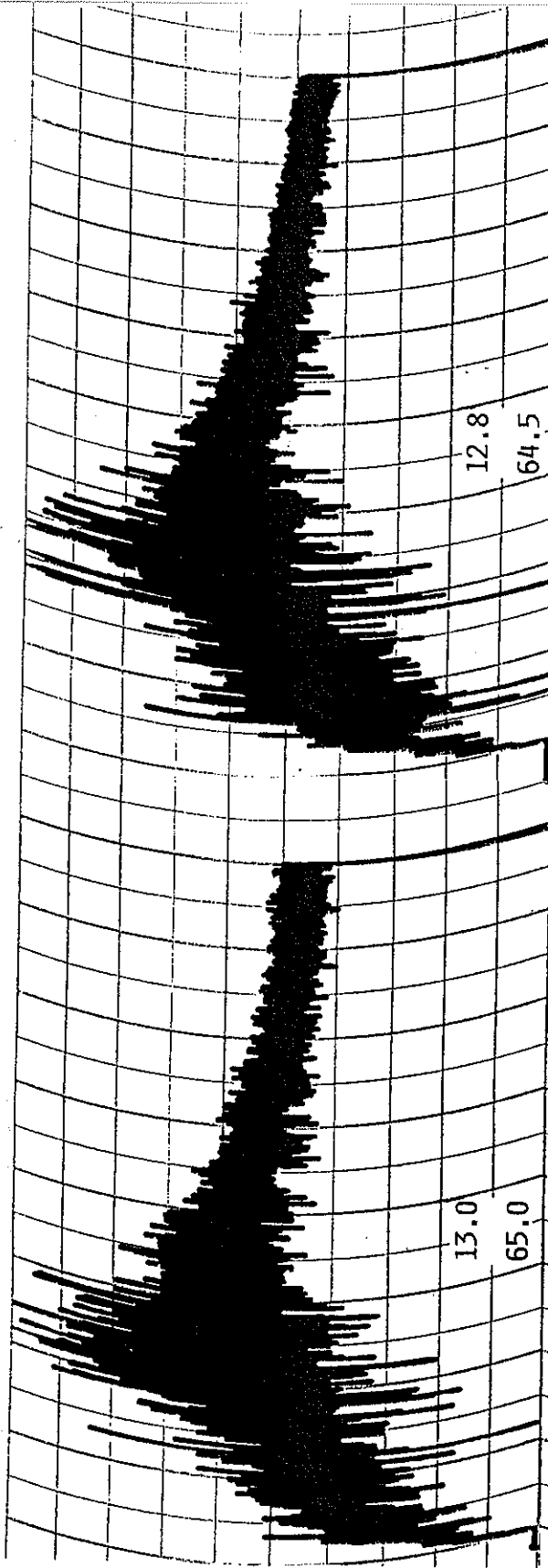
Lab no.	Cultivar	Test Weight	Ext. (%)	SE (%)	Milling Grade
STANDARD	ARKAN	62.3	77.8	41.8	
90427	ADVANTAGE	61.3	80.2	44.1	
90430	HAVEN	62.9	78.7	43.2	
90425	ARKAN	62.3	77.8	41.8	
90431	GSR 5380	61.9	76.9	44.1	
90426	NEWTON	63.7	76.5	44.0	
90428	GSR 1005	61.8	76.3	42.9	
90429	GSR 1056	61.8	74.6	46.0	

FRENCH GROWN GOERTZEN CULTIVARS

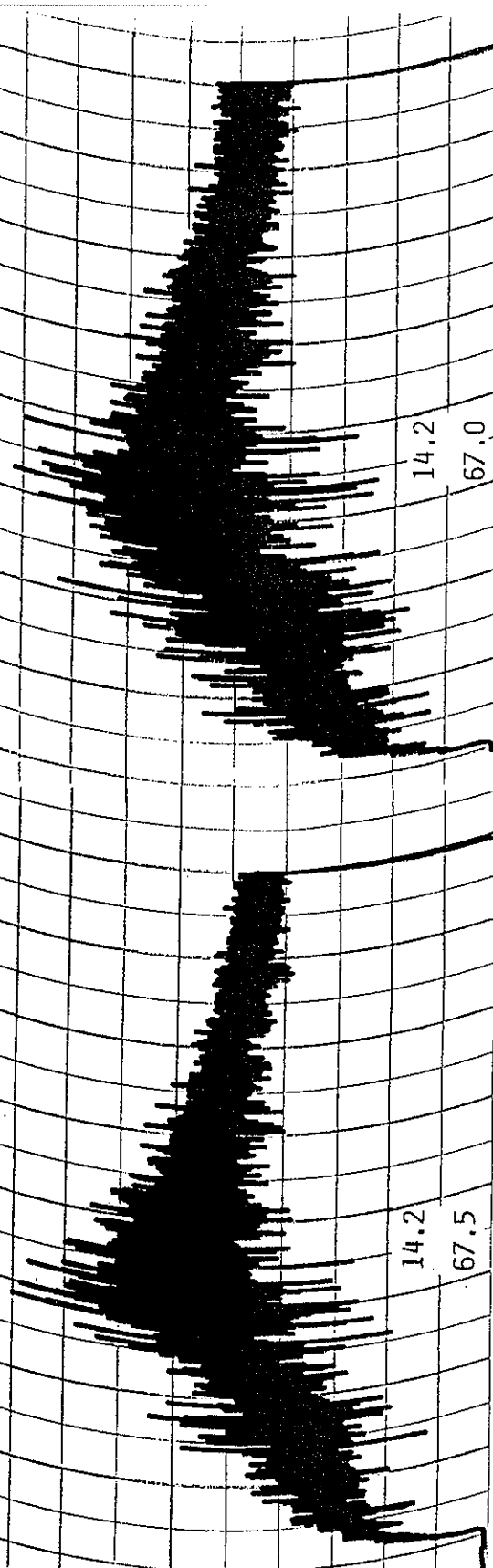
9100060

1990 GOERTZEN STUDY

ENGLAND



KANSAS



HAVEN

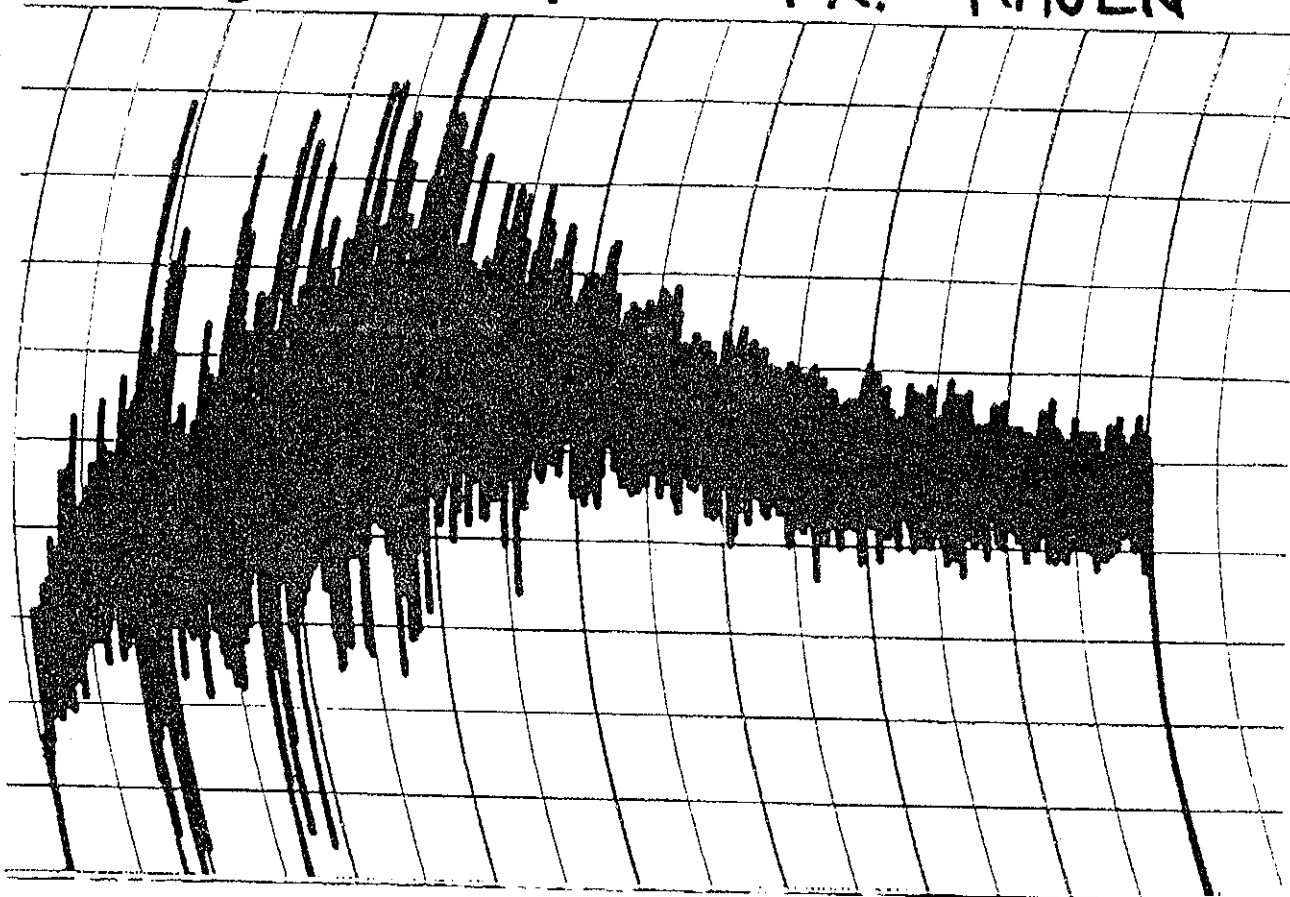
ADVANTAGE

9100060

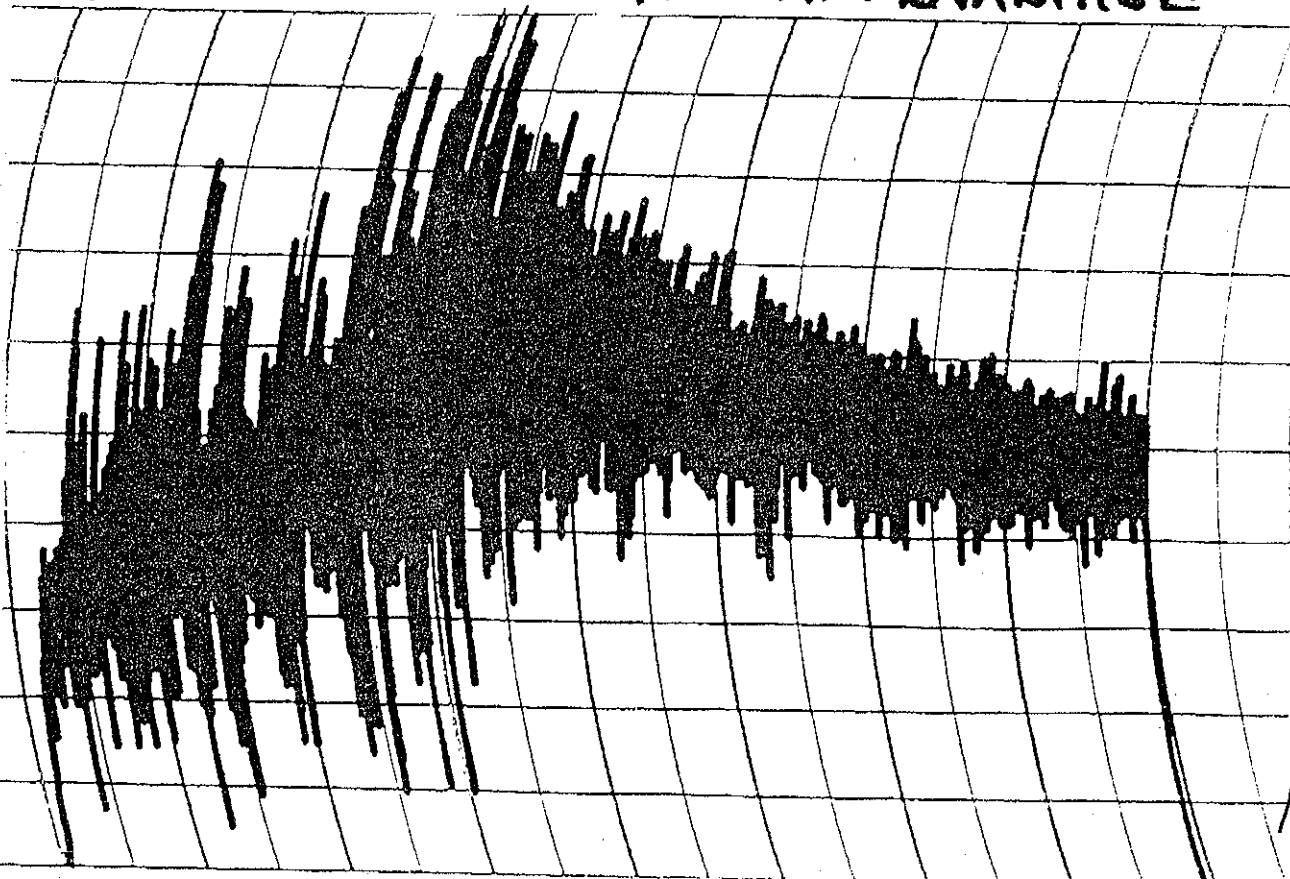
9

90-430 67.0%

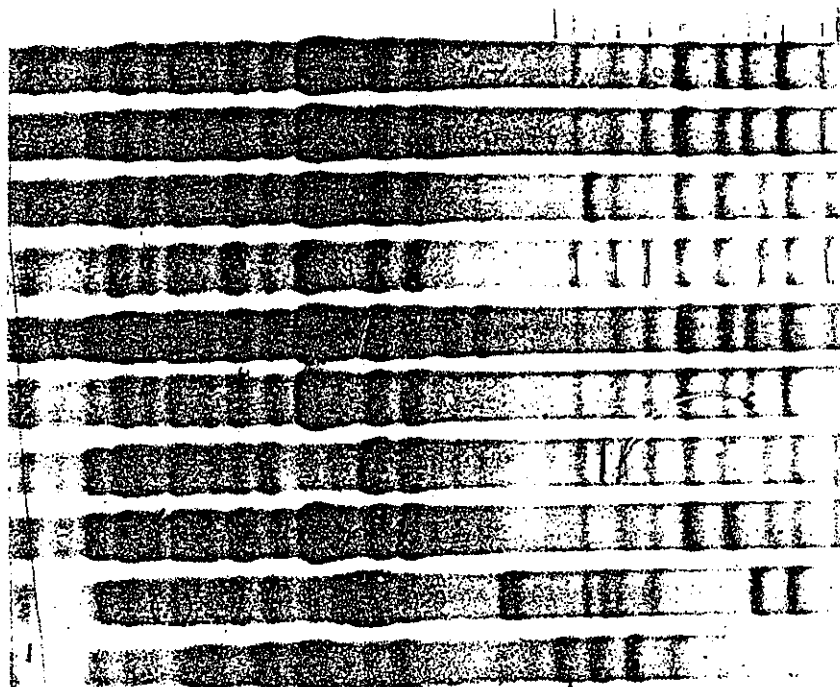
FR. HAVEN



90-427 67.0% FR. ADVANTAGE



High
Molecular
Weight
Glutenin
Subunits



G-53 Advantage

G-1760

G-1250 Voyager

G-1990

G-1857 Haven

G-542

G-790

G-1759

G-56

G-7062

Results-Yields-8886:#text

Page 1

Location: 1988 Blocker6, Haven
 Conditions: Dryland
 Plot size: 43.33 sq. ft.
 Reps: 3

YIELD RANK	VARIETY	BU/A AVE.	IBS/A AVE.	K/H AVE.	J/M AVE.	% TEST AVE
* 1	(G1857) Haven G62xG53F5	54.45	3267.24	3662.09	495.04	112.342
* 2	GH42F4	54.31	3258.86	3652.70	493.77	112.054
* 3	G3XG46F5	53.06	3183.46	3568.19	482.34	109.462
* 4	G36xG38F5	50.96	3057.80	3427.34	463.30	105.141
* 5	GH40F4	50.27	3015.91	3380.39	456.96	103.701
6	G39xG2F5	49.11	2946.80	3302.92	446.48	101.324
7	GH33F4	48.97	2938.42	3293.53	443.22	101.036
8	OkeeneBlend	48.69	2921.66	3274.75	442.68	100.460
9	G3XG43F5	48.38	2902.82	3253.62	439.82	99.812
10	G53xG36F5	48.00	2879.78	3227.80	436.33	99.020
11	G38xG62F5	47.82	2869.31	3216.06	434.74	98.660
12	GH18F4	47.65	2858.83	3204.33	433.16	98.300
13	G44xG33	47.65	2858.83	3204.33	433.16	98.300
14	G42xG43F5	46.95	2816.95	3157.38	426.81	96.859
15	G33xG32F5	46.77	2803.47	3145.64	425.22	96.499
16	GH12F4	46.18	2770.87	3105.73	419.83	95.275
17	G1043	43.81	2628.45	2946.10	398.25	90.378
18	G38xG33F5	39.44	2366.65	2652.67	358.58	81.376

Analysis of Variance

126871.80000000 = MSS

115.11720000 = RSS

650.40630000 = TSS

298.11720000 = ESS

127935.40000000 = TOTAL SS

57.55859000 = RMS 2 DF

38.25919000 = TMS 17 DF

8.76815300 = EMS 34 DF

53 DF

2.03 = T(.05)

4.91 = LSD(.05)

2.96 = Standard Deviation

6.11 = CV

54.45 = HIGHYIELD

39.44 = LOWYIELD

48.47 = TRIAL MEAN

SELECTED DATA FROM 1989 YIELD TRIAL
HAVEN, KANSAS

1989 was a severe testing year with a sudden temperature drop in early February that caused much winter killing to many commercial as well as experimental wheats. Both Newton and Arkan checks were damaged but made good recovery. The drouth that followed also reduced the yields. The plot was fertilized expecting 60-80 bushel yields so protein readings are higher than expected.

VARIETY or EXPERIMENTAL	Bu./Acre Yields	PROTEIN % (as is moisture)
G542	46	16.5
G1857 (Haven)	39	16.7
G1600	39	17.4
G1093	38	16.1
Advantage	36	16.8
Newton (check)	36	14.6
Norkan (check)	36	16.3
G1113	36	16.9
G790	35	17.2
G1250 (Voyager)	35	16.1
G1598	33	17.6
G1759	33	19.2
Plainsman V	32	19.3
G1760	32	17.9
Arkan (check)	32	14.9

Location: 1990 GSR, Haven Yield Trial No. 6
Conditions: Dryland
Plot size: 43.33 sq. ft.
Reps: 3

YIELD RANK	VARIETY	BU/A AVE.	IBS/A AVE.	K/H AVE.	J/M AVE.	% TEST AVE
* 1	G1056	70.77	4246.36	4759.54	643.39	118.574
* 2	G1803	69.99	4199.24	4706.72	636.25	117.538
* 3	Haven	69.55	4173.06	4677.38	632.28	116.527
* 4	G826	68.33	4099.76	4595.22	621.18	114.480
* 5	Advantage	66.58	3995.04	4477.84	605.31	111.556
* 6	G1644	65.80	3947.91	4425.02	598.17	110.240
* 7	G771	64.66	3879.85	4348.73	587.86	108.339
* 8	G756	63.79	3827.49	4290.04	579.92	106.877
* 9	G1806	63.09	3785.60	4243.09	573.58	105.708
10	G1724	61.78	3707.06	4155.06	561.68	103.515
11	G1613	60.91	3654.70	4096.37	553.74	102.053
12	Arkan	60.48	3628.52	4067.03	549.78	101.322
13	G1723	60.13	3607.58	4043.56	546.60	100.737
14	G758	59.43	3565.69	3996.61	540.26	99.567
15	G1733	57.25	3434.79	3849.89	520.42	95.912
16	G1737	56.46	3387.67	3797.07	513.28	94.596
17	Abilene	56.11	3366.72	3773.59	510.11	94.011
18	G1614	55.59	3335.31	3738.38	505.35	93.134
19	G1681	54.72	3282.95	3679.69	497.42	91.672
20	G1642	54.28	3256.77	3650.35	493.45	90.941
21	G1734	54.28	3256.77	3650.35	493.45	90.941
22	G754	53.76	3225.35	3615.14	488.69	90.064
23	NEWTON	52.71	3162.52	3544.71	479.17	88.309
24	G751	52.45	3146.81	3527.11	476.79	87.870
25	G1759	51.66	3099.69	3474.29	469.65	86.555
26	G1250	47.30	2837.89	3180.85	429.98	79.244

Analysis of Variance

277873.90000000 = MSS
14.46875000 = RSS
3087.68700000 = TSS
1491.53100000 = ESS
282467.60000000 = TOTAL SS

7.23437500 = RMS 2 DF
123.50750000 = TMS 25 DF
29.83062000 = EMS 50 DF
77 DF

2.01 = T(.05)
8.95 = LSD(.05)
5.46 = Standard Deviation
9.15 = CV
70.77 = HIGHYIELD
47.30 = LOWYIELD
59.65 = TRIAL MEAN

EXHIBIT E STATEMENT OF THE BASIS OF APPLICANT'S OWNERSHIP

G1857 experimental was the result of a cross made selected and tested by Kenneth & Betty Goertzen wheat breeders for Goertzen Seed Research.